METEOROLOGICAL SESSION

Project PAPA, the Integration of Drifting Buoy Data into an Operational Meterological Service
- D Bourque (Atmospheric Environment Service, Canada)

Application of the Argos Data Collection System in Arctic Regions
- F. Jensen (Danish Meteorological Institute, Denmark)

The Balsamine Experiment
- H. Ovarlez, D. Cadet (Laboratory of Dynamic Meteology, Denmark)

Mountain Barrier Baroclinity Effects on Surface Winds Along the Alaskan Arctic Coast
- T. Kozo (Tetra Tech Inc., USA)

OCEANOGRAPHY SESSION

Data Collection and Winter Ice Dynamics in the Beauford Sea
- R. Hoare, J. Mercer, S. dePaoli (Dome Petroleum Ltd, Canada)

Automatic Buoys to Assist Tuna Fishing Off the Azores
- G. Fialho (VRP Barros-Institut National de Recherches sur la Peche, Portugal)

EARTH SCIENCE SESSION

Report on the Panel Discussion Held During the Workshop on Data Collection Platform Networks
- J Fortin (University of Quebec, Canada)

The ARGOS System and Hydrology
- J. Callede (ORSTOM, France)

Hydrometric Telemetry in Canada
- I Reid, K. Davies, J. Clarke (Water Survey of Canada, Canada)

1979 ARGOS USER'S CONFERENCE

LANHAM, MARYLAND, USA SEPTEMBER 13 - 14, 1979

OPENING SESSION

The Argos System: Technical Data Concerning Orbits, Data Acquisition and Platform Location
- A. Goasguen (Service Argos, CNES, France)

The ARGOS System: Data Processing, Availability and Distribution of Results
- J.-L. Bessis (Service Argos, CNES, France)

The ARGOS System: Situation and Progress to Date
- M. Taillade (Service Argos, CNES, France)

Argos Data Distribution System
- G. Sans (CNES, France)

OCEANOGRAPHIC SESSION

Operational Use of Tiros/Argos System in International Ice Patrol
- J. Murray, C. Weir (U.S. Coast Guard Oceanographic Unit)

US Drifting Buoy Performance During FGGE
- E. Kerut, R. Kozak (NOAA Drifting Buoy Office, USA)

Preliminary Results of Gulf Stream Ring Tracking via Satellite-Tracked Drifters
- B. Blumenthal (US Naval Oceanographic Office, USA)

METEOROLOGICAL SESSION

Utilization of the Tiros-N Argos System for the Tropical Constant Level Balloon Experiment
- P. Julian, E. Lichfield (National Center for Atmospheric Research, NOAA, USA)

TECHNICAL ADVANCEMENT SESSION

Australian Operational Experience in Using the Argos System
- R. de la Lande (Australian Drifting Buoy Program, Bureau of Meteorology, Melbourne)

The Transpacific Experimental Sailing by "Yasei-Go III"
- H. Ochiai (Toba Merchant Marine College, Japan), H. Kodokawa (The Society of Ancient Pacific Cultures, Japan), S. Takeuchi (Remote Sensing Technology Center of Japan, Japan)

Presentation of Electronique Marcel Dassault and Argos Platforms
- M. Jeanjeau (Electronique Marcel Dassault Society, France)

Tiros N-Argos: Some Canadian Experience
- H. Wiebe (Dome Petroleum, Canada)

1977 ARGOS USER'S MEETING

PARIS, FRANCE NOVEMBER 2 - 3, 1977

Argos User's Working Group
Spacecraft Presentation
System Presentation
Performance
Processing

APPENDIX 5

MicroSat Launch Systems

One Harbour Square, Suite 220
3027 Marina Bay Drive
League City, TX 77573
(713) 334-4212 *(voice)*
(713) 334-3951 *(fax)*

30 April 1990

Dr. Ashok Kaveeshwar
President
STARSYS, Inc.
2000 K Street NW, Suite 610
Washington, DC 20006

Dear Dr. Kaveeshwar:

MicroSat Launch Systems (MicroSat) looks forward to working with STARSYS, Inc. to provide launch services for your STARNET spacecraft. As you know, our launch system is currently being developed in conjunction with several major aerospace firms who are highly experienced in the area of launch systems and launch operations.

As we have discussed under our confidentiality agreement, MicroSat has plans to provide a vehicle designed to ideally suit the launch needs of the STARSYS planned STARNET system. Further, MicroSat is confident that the vehicle will be able to provide reliable operations within your proposed budget and timeframe. Because MicroSat's pricing scheme and vehicle designs are at this time proprietary we are not able to divulge in a public document detailed information. We look forward to working together to successfully implement this important and timely system.

Sincerely,

[redacted]

MEMORANDUM OF UNDERSTANDING

between

STARSYS, Inc. (STARSYS)

and

MicroSat Launch Systems, Inc. (MicroSat)

Whereas STARSYS, Inc., has interests in;

1) Establishing a low-Earth orbit constellation of 24 STARNET spacecraft to provide communications and positioning information services;
2) Identifying a low cost and reliable launch provider for 24 launches to implement the STARNET system and services;
3) Identifying a launch capability able to provide the required launches in a prompt and efficient period in the 1994 to 1995 time frame;
4) Identifying a launch capability that will be able to service the STARNET spacecraft constellation to replace individual satellites as required in a rapid and low-cost fashion; and,
5) Entering into an arrangement with a low-cost provider of launch services.

And Whereas MicroSat Launch Systems, a privately owned launch company, has interests in:

1) Providing low-cost reliable access to low-Earth orbit for microsatellite payloads;
2) Providing a vehicle ideally suited to meet the launch needs of the STARNET spacecraft;
3) Providing payload integration of the STARNET spacecraft into the MicroSat launch vehicle;
4) Providing low-Earth orbit launch services for the lowest per-launch cost available; and,
5) Launching the STARNET spacecraft on a dedicated basis and in a timely manner which complies with the needs of STARSYS, Inc., to implement the STARNET system.

Be It Resolved Therefore that STARSYS, Inc. and MicroSat will enter into negotiations to agree upon:

1) A price to be paid MicroSat for the low-Earth orbit launch services;
2) The weight and size of the payloads to be launched;
3) Mission parameters such as orbital altitude and lifetime;
4) A schedule of payments to MicroSat for the launch services;
5) A time period within which the launch will take place;
6) A date for delivery of the STARSYS, Inc., payloads to the launch site; and,
7) Such other terms and conditions as may be appropriate.

The undersigned hereby acknowledge this **Memorandum of Understanding** this 30th day of April, 1990.

Peter H. Diamandis
President and C.E.O.
MicroSat Launch Systems

/s/Ashok Kaveeshwar
Ashok Kaveeshwar
President
STARSYS, Inc.

APPENDIX 6

CERTIFICATE OF INCORPORATION

OF

STARSYS, Inc.

1. The name of the corporation is STARSYS, Inc.

2. The address of its registered office in the State of Delaware is Corporation Trust Center, 1209 Orange Street, in the City of Wilmington, County of New Castle. The name of its registered agent at such address is The Corporation Trust Company.

3. The nature of the business or purposes to be conducted or promoted is:

To engage in any lawful act or activity for which corporations may be organized under the General Corporation Law of Delaware. In particular, the corporation will apply to secure authorization to build, launch and operate a satellite system to serve the U.S. public interest, including compliance with the requirements of the Communications Act of 1934.

4. The total number of shares of stock which the Corporation shall have authority to issue is 10,000, comprised of one class of Class A Common Stock consisting of 500 shares, with a par value of $1.00 per share, and one class of Class B Common Stock consisting of 9,500 shares, with a par value of $1.00 per share. The designations and the powers, preferences and rights of the Class A Common Stock and the Class B Common Stock shall be as follows:

(i) The voting power solely for the election of directors shall be vested as provided in this subparagraph (i). The holders of the Class A Common Stock shall be entitled to 20 votes for each share of Class A Common Stock standing in the name of such holder upon the books of the Corporation. The holders of the Class B Common Stock shall be entitled to one vote for each share of Class B Common Stock standing in the name of such holder upon the books of the Corporation.

(ii) Except as provided in subparagraph (i) above, the entire voting power shall be vested as provided in this subparagraph (ii). The holders of the shares of the Class A Common Stock shall be entitled to one vote for each share of Class A Common Stock standing in the name of such holder upon the books of the Corporation. The holders of the shares of the Class B Common Stock shall likewise be entitled to one vote for each share of Common Stock standing in the name of such holder upon the books of the corporation.

(iii) The holders of the shares of Class A Common Stock and Class B Common Stock shall be entitled to participate ratably, according to the respective number of shares of stock held by them and without preference of any class over the others, in such dividends, if any, as from time to time in the discretion of the Board of Directors may be declared and made payable out of funds legally available therefor; except that, in any distribution with respect to Common Stock or right to acquire Common Stock (whether by stock dividend, distribution of rights, recapitalization or otherwise), only Class A Common Stock (or rights to acquire Class A Common Stock) will be distributed with respect to Class A Common Stock and only Class B Common Stock (or rights to acquire Class B Common Stock) will be distributed with respect to Class B Common Stock.

(iv) In the event of any dissolution, liquidation or winding up of the Corporation, the holders of the shares of Class A Common Stock and Class B Common Stock shall share ratably, according to the number of shares of Common Stock held by them, in any payment or distribution of the net assets of the Corporation available for distribution to its stockholders.

(v) Except as set forth in this paragraph 4, the Class A Common Stock and the Class B Common Stock shall be identical in all respects and shall have the same designations, powers, preferences and rights.

5. The name and mailing address of each incorporator is as follows:

NAME	MAILING ADDRESS
Archie E. Shaw III	2817 Glen Isle Road Riva, Maryland 21140
Raul Rodriguez	2000 K Street, N.W. Suite 600 Washington, D.C. 20006

6. The corporation is to have perpetual existence.

7. At all elections of directors of the corporation, each stockholder shall be entitled to as many votes as shall equal the number of votes which (except for such provision as to cumulative voting) he would be entitled to cast for the election of directors with respect to his shares of stock multiplied by the number of directors to be elected by him, and he may cast all of such votes for a single director or may distribute them among the number to be voted for, or for any two or more of them as he may see fit.

8. Elections of directors need not be by written ballot unless the by-laws of the corporation shall so provide.

Meetings of stockholders may be held within or without the State of Delaware, as the by-laws may provide. The books of the corporation may be kept (subject to any provision contained in the statutes) outside the State of Delaware at such place or places as may be designated from time to time by the board of directors or in the by-laws of the corporation.

9. The corporation reserves the right to amend, alter, change or repeal any provision contained in this certificate of incorporation, in the manner now or hereafter prescribed by statute, and all rights conferred upon stockholders herein are granted subject to this reservation.

10. A director of the corporation shall not be personally liable to the corporation or its stockholders for monetary damages for breach of fiduciary duty as a director except for liability (i) for any breach of the director's duty of loyalty to the corporation or its stockholders, (ii) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, (iii) under Section 174 of the Delaware General Corporation Law, or (iv) for any transaction from which the director derived any improper personal benefit.

We, THE UNDERSIGNED, being each of the incorporators hereinbefore named, for the purpose of forming a corporation pursuant to the General Corporation Law of the State of Delaware, do make this certificate, hereby declaring and certifying that this is our act and deed and the facts herein stated are true, and accordingly have hereunto set our hands this 2nd day of May, 1990.

Archie E. Shaw III

Raul Rodriguez

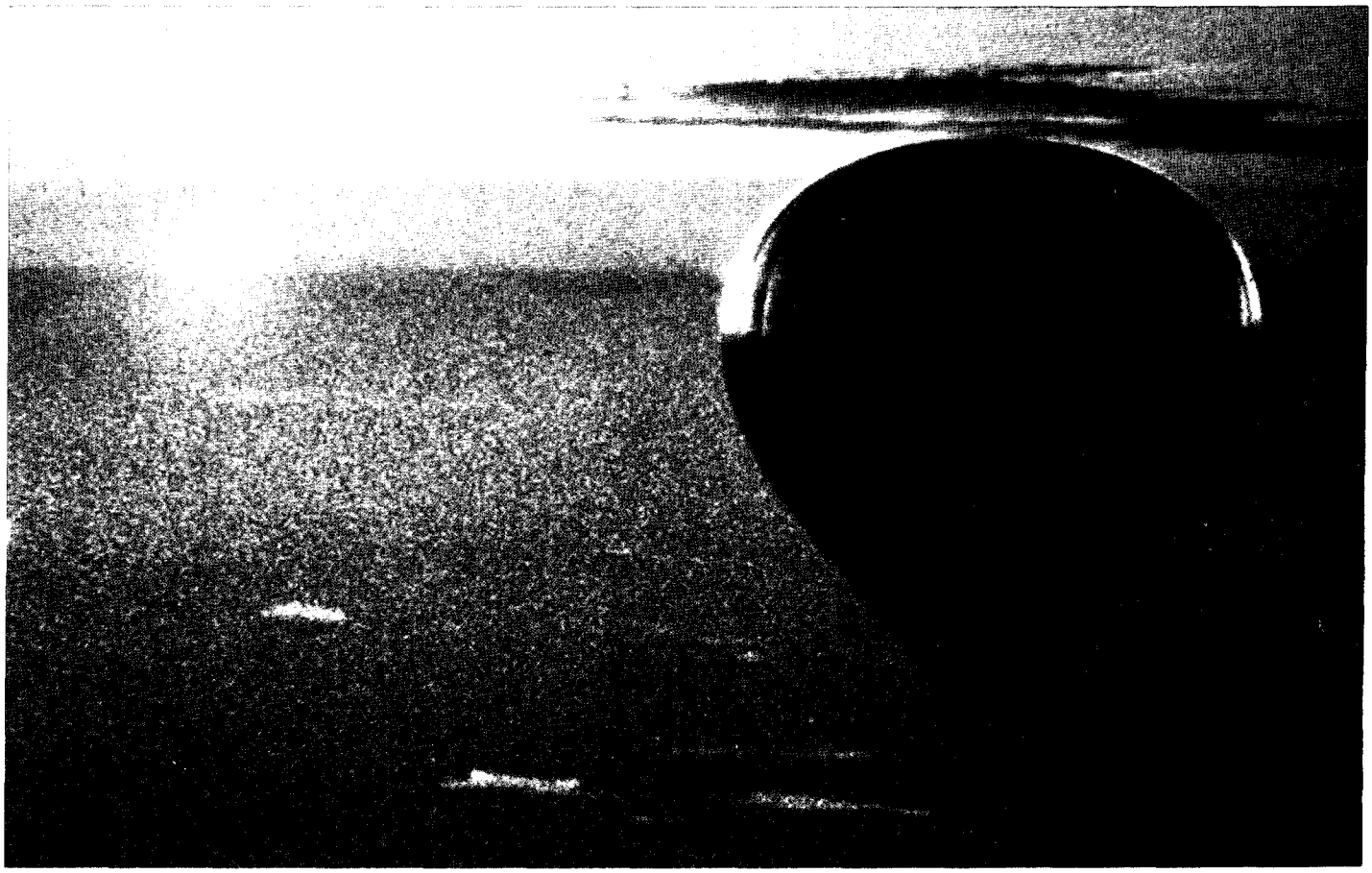
APPENDIX 7

NACLS CATALOG OF PRODUCTS & SERVICES

ARGOS 16 PAGE BROCHURE

NORTH AMERICAN COLLECTION & LOCATION BY SATELLITE

North American C.L.S., Inc.



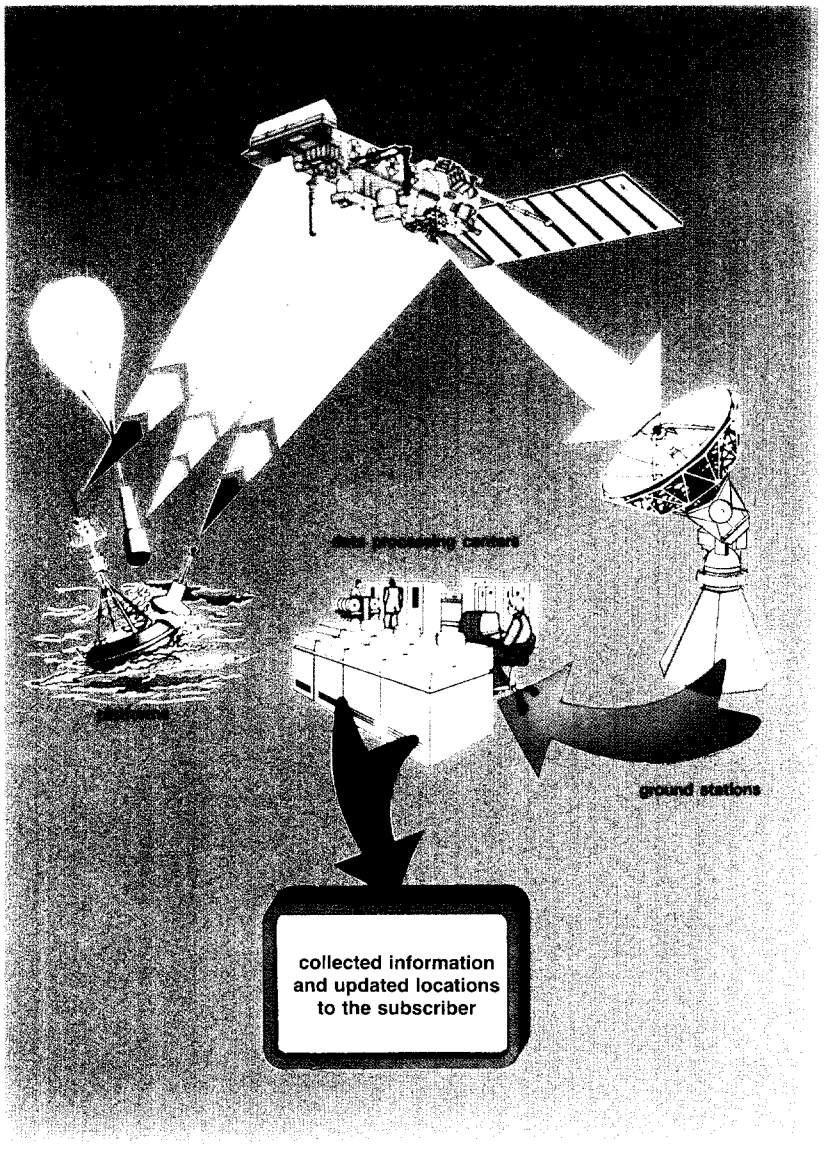
CATALOG

EQUIPMENT, PRODUCTS AND SERVICES

North American C.L.S., Inc.

(NACLS) is a subsidiary of CLS (Collecte Localisation Satellites), the company responsible for maintaining the global environmental satellite data collection and location system known as Argos.

NACLS is positioned to provide North American users unique system services, equipment, and value added data products to the Argos system and other satellite-based location and data collection systems. Business activities include market research, turn-key systems, engineering and consulting, equipment sales/rental, joint commercial ventures, and more...



Data Collection & Location Platforms

The Argos data collection and location system can position and track anything anywhere in the world with the assistance of a **PTT (Platform Transmitter Terminal)**. PTTs transmit up to 256 bits of environmental sensor information for processing and dissemination to individual users. NACLS has an extensive line of PTTs, appropriate for any application, available for sale or rental.

Cover photo courtesy of Thunder & Colt, Shropshire, England

Applications

Courtesy of Dr. Alan Woolf/Cooperative Wildlife Research Laboratory
Southern Illinois University at Carbondale

Courtesy of D. Faure Parc National
Du Mercantour–France

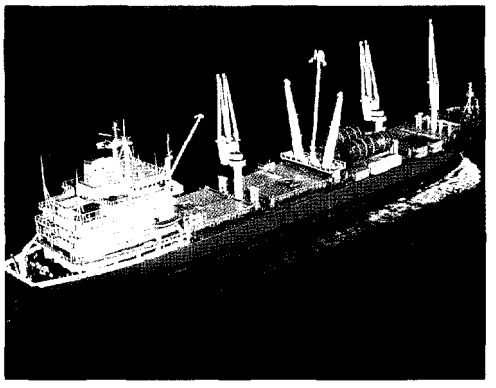
Courtesy of Sea Mammal Research Unit
Cambridge, United Kingdom

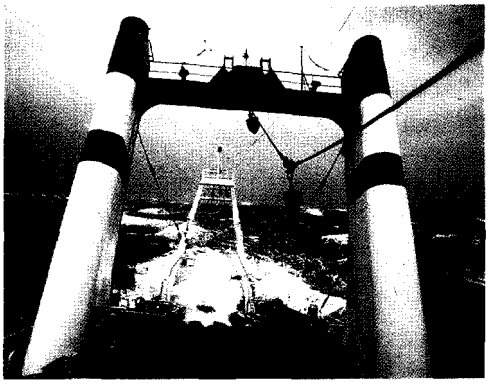
Animal Tracking

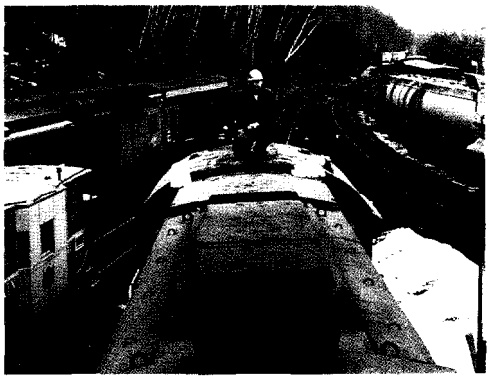
Argos data collection and location complemented with Class 0 Location Service make up the most effective tracking method for biological applications.

ntainer/Cargo Surveillance

Highly valued containers or hazardous cargo can be monitored continually, on land or at sea, from origin to destination. Loss control can be attained with this application.







Fleet Control

Merchant Marine

Confidential, accurate positional information and technical data, as well as weather routing and forecast data, guarantee more efficient maritime fleet management.

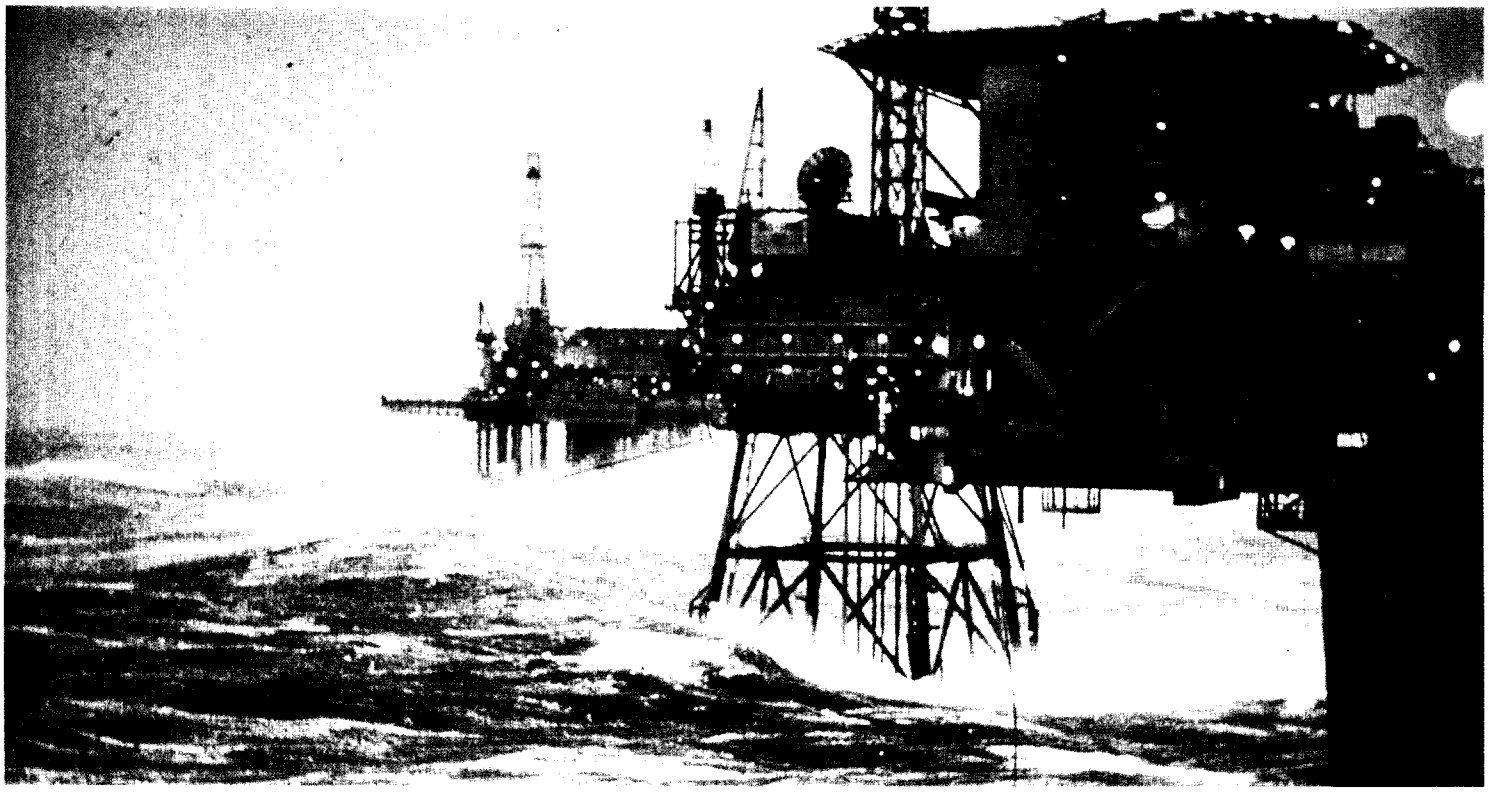
Fishing and Research Vessels

With the assistance of NACLS equipment and services, vessel guidance into fishing areas and transmission of specific catch data to shore can be done confidentially. This capability is significant for scientific organizations conducting fish stock studies.

Trucks and Trains

Currently, NACLS is cooperating in a pilot program providing fleet control for trucks and trains in North America. This utilization provides a user's headquarters with information and location update reports through direct data distribution.

Courtesy of Railstar, Merrimack, NH
Railstar has developed systems for acquisition of sensory data using the Argos System

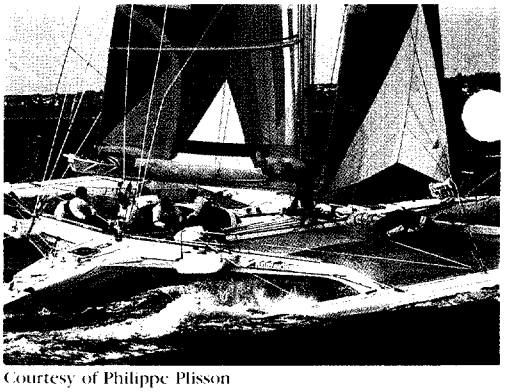


Offshore Operations

In addition to providing information on weather conditions, NACLS can accurately track large offshore structures in tow and provide access to current location data. NACLS has been involved in pollution tracking and iceberg drift prediction. The Accurate Positioning service can deliver accuracies within 20 meters.

Racing & Record Breaking

On land, across ocean, or in air, NACLS can equip one or any number of participants with transmitting devices designed for the event. Race headquarters is updated on important information, valuable for media coverage. Race reports include general positions and individual performance figures (i.e., distance to finish, total distance covered, speed, estimated time of arrival, etc.). Alarm Monitoring service ensures expeditious notification to designated authorities in the event of an emergency.



Courtesy of Philippe Plisson

Situational Monitoring

Moored Buoys

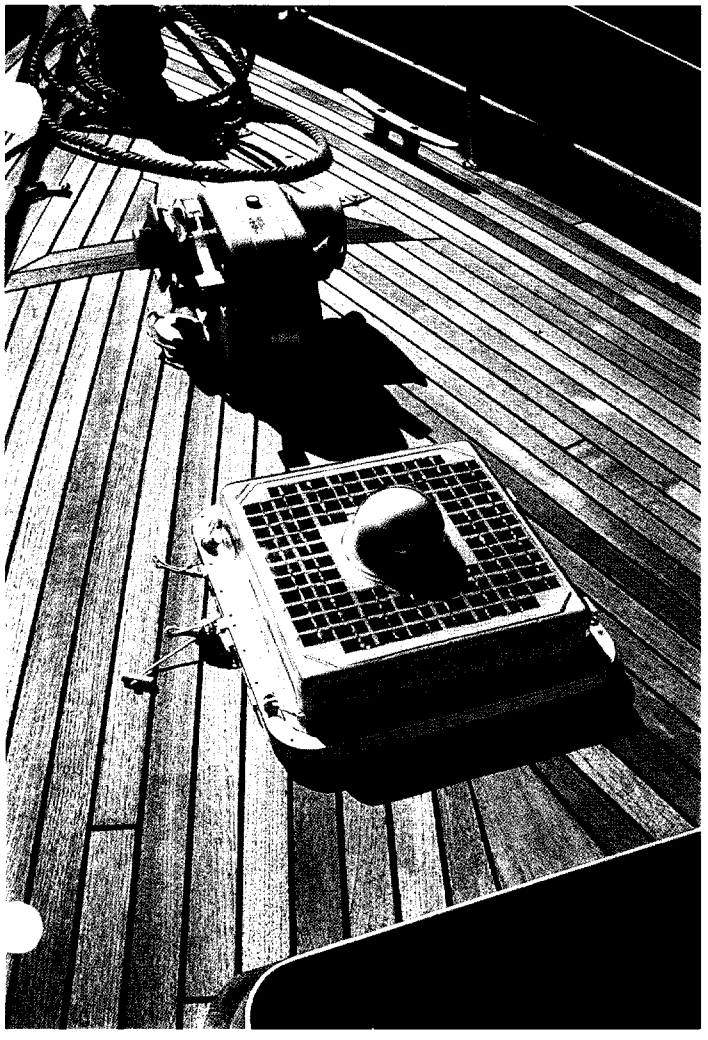
Watch-Circles define areas within which normal operations of a fixed station exist. Through positional analysis with respect to a buoy's watch-circle, Alarm Monitoring service is able to detect when a buoy has broken loose from its mooring, gone adrift, and poses a navigational hazard.

Sensor Monitoring

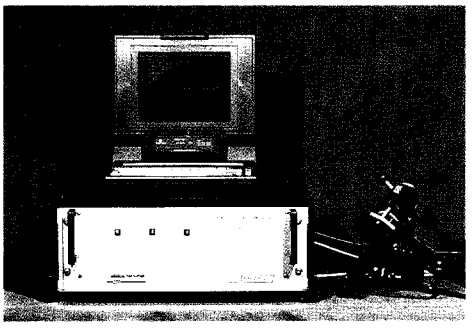
Parameter limits can be pre-defined by a user. Alarm Monitoring service will check conditions where a sensor reading may exceed its acceptable limit.

Pop-up

Researchers continue to perfect ways of allowing signal transmission only when a unit surfaces, thus conserving battery life. Alarm Monitoring service is able to detect when a subsurface platform has broken loose from its mooring and risen to the ocean surface.



CML 86



XBT

PAB

CML 86

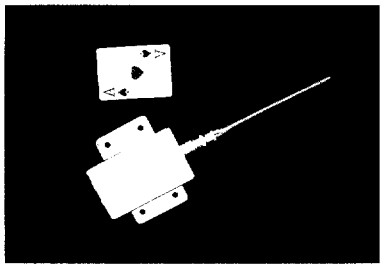
This solar-powered 'deck' unit is fully self-contained, watertight, and buoyant. Designed specifically for the maritime environment, it allows location and automatic weather data collection, as well as distress signal transmission. The CML86 can be easily removed from its mounting base and placed into a life raft in the event of an emergency.
WEIGHT - 7.7 kg

PAB

Designed primarily for installation in a pilothouse or radio room, this ship-powered terminal interfaces with a microcomputer. The PAB transmits weather data automatically on every pass, freeing the crew to key in other informative data. This PTT is ideal for communication with monitoring bases and deep-sea fishing fleet operations.
A watertight version is also available.
WEIGHT - 6.4 kg

XBT

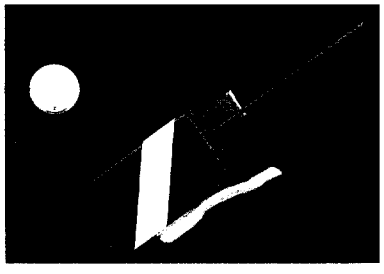
The XBT (expendable bathythermograph) unit is a deep ocean temperature profiling system comprised of an XBT probe launcher, a microcomputer, and a special module for data acquisition and transmission. Temperature data is collected at ocean depths to 1000 meters, and then the software computes bathy messages and formats them for transmission through Argos.
WEIGHT - 10.0 kg



Adventure Series

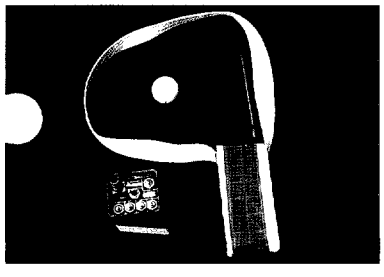
A1

This simplistic approach to the hand-sized unit allows only positioning and transmission of ambient temperature information.
WEIGHT - 1.1 kg



A2

This hand-size positioning unit transmits ambient temperature information and provides the feature of a distress signal, but no coded messages.
WEIGHT - 0.9 kg



A3

The A3 Adventure unit is ideal for locating expeditions and individual users. It is portable, watertight, and designed to operate in extreme weather conditions. This platform can transmit ambient temperature information, sixteen coded messages, and an emergency signal should the user be in trouble.
WEIGHT - 1.4 kg

Services

Class 0 Location

This special processing service provides the maximum number of locations that the Argos system can calculate (from as few as two messages received), and allows users to choose the most probable positions for their specific applications.

Direct Data Distribution

Another feature provided by NACLS to assist real-time users of satellite-based environmental data and location information. Immediately following the processing, or at scheduled time intervals, data is automatically disseminated to the users' systems.

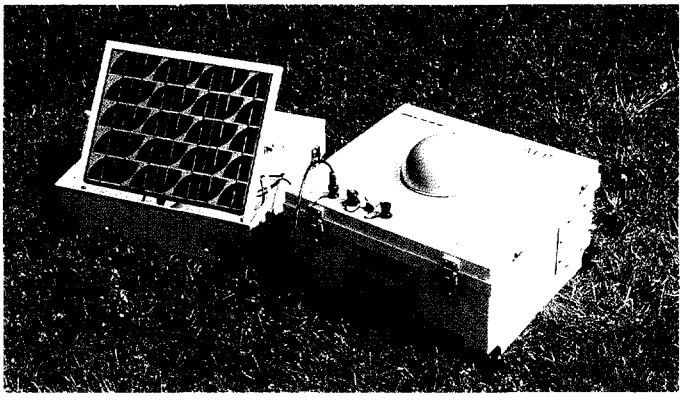
Archived Data

NACLS offers archived data on magnetic tape, 3.5 or 5.25 inch floppy disks, or printout throughout a program's duration to customers of satellite-based data collection systems.

Maritime Service

(also see CML86 & PAB)

Ship-to-shore communication systems for environmental, logistical, or other informational data (with optional alphanumeric messaging) are engineered to meet individual user needs. User friendly keypad entry devices, or protable self-contained mini-weather stations are provided. Location and message updates in easy-to-read format are forwarded to fleet control headquarters through Direct Data Distribution or other means of dissemination.



Accurate Positioning

This service provides the necessary number of platforms for deployment at the set of points to be located. A report is supplied for individual position or for the complete array. Trajectories of slow moving mobiles (< 1 km/day) are shown in a table and a graph. For fixed positions, the results comprise the position and statistical data. Location accuracy with a probability of 95% is 30 m for an absolute location, and 20 m for positions relative to a second platform. Location results are supplied as two (Lat, Lon) or three (Lat, Lon, Alt) dimensional coordinates.

XBT Service

(also see XBT)

End-to-end systems will collect temperature-depth information and transmit the data via satellite. This data is received at global processing centers and placed onto the Global Telecommunication System (GTS). The system includes the standard Argos location service plus special processing to convert the XBT data to BATHY code.

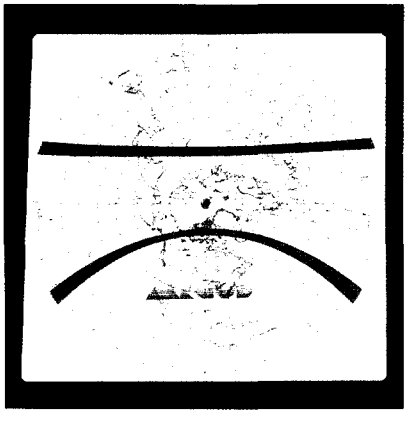
Alarm Monitoring

Dedicated routines are programmed into the software of the Argos Processing Center in order to detect Alarm conditions. These alarms include those for distress and extended periods of non-reception of transmission, and for situational monitoring. Operators are alert to these conditions during all hours of the day.

Customized Software

Dedicated software may be developed to meet individual customer needs. Customized packages can greatly enhance system effectiveness at the user interface.

Simplified Orbital Parameters Service (SOPS)



A plastic Planisphere with northern and southern hemisphere and spacecraft ground track allows user to obtain satellite pass predictions after consulting the simplified orbital parameters file on the Argos on-line dissemination computer.

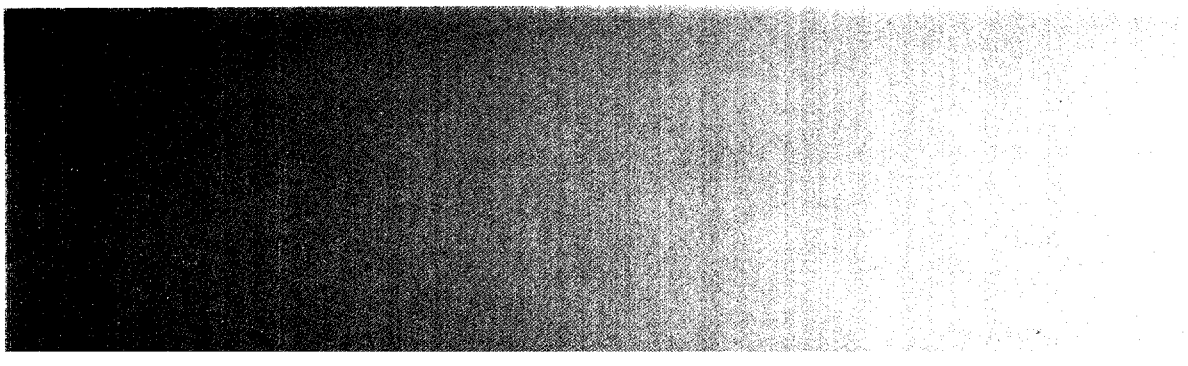
For more information:

NACLS, 1801 McCormick Drive, Suite 10, Landover, MD 20785 USA
Tel: (301) 341-1814 Telex: 898 146
Telecopier: (301) 925-8995

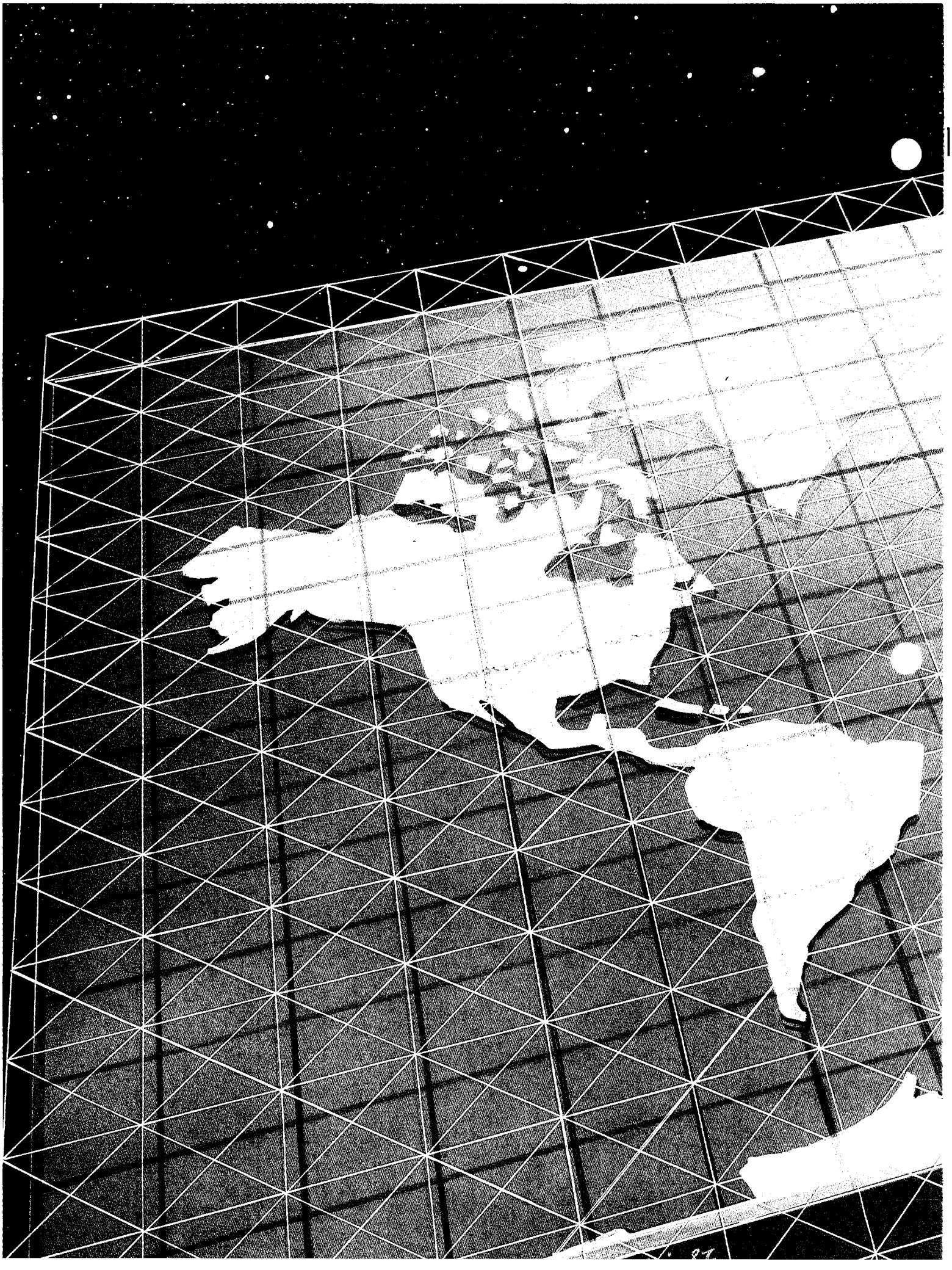
CLS/Service Argos, 18 Avenue Edouard-Belin, 31055 Toulouse Cedex, France
Tel: 33 61 39 47 00 Telex: 531 752F
Telecopier: 61 27 35 76

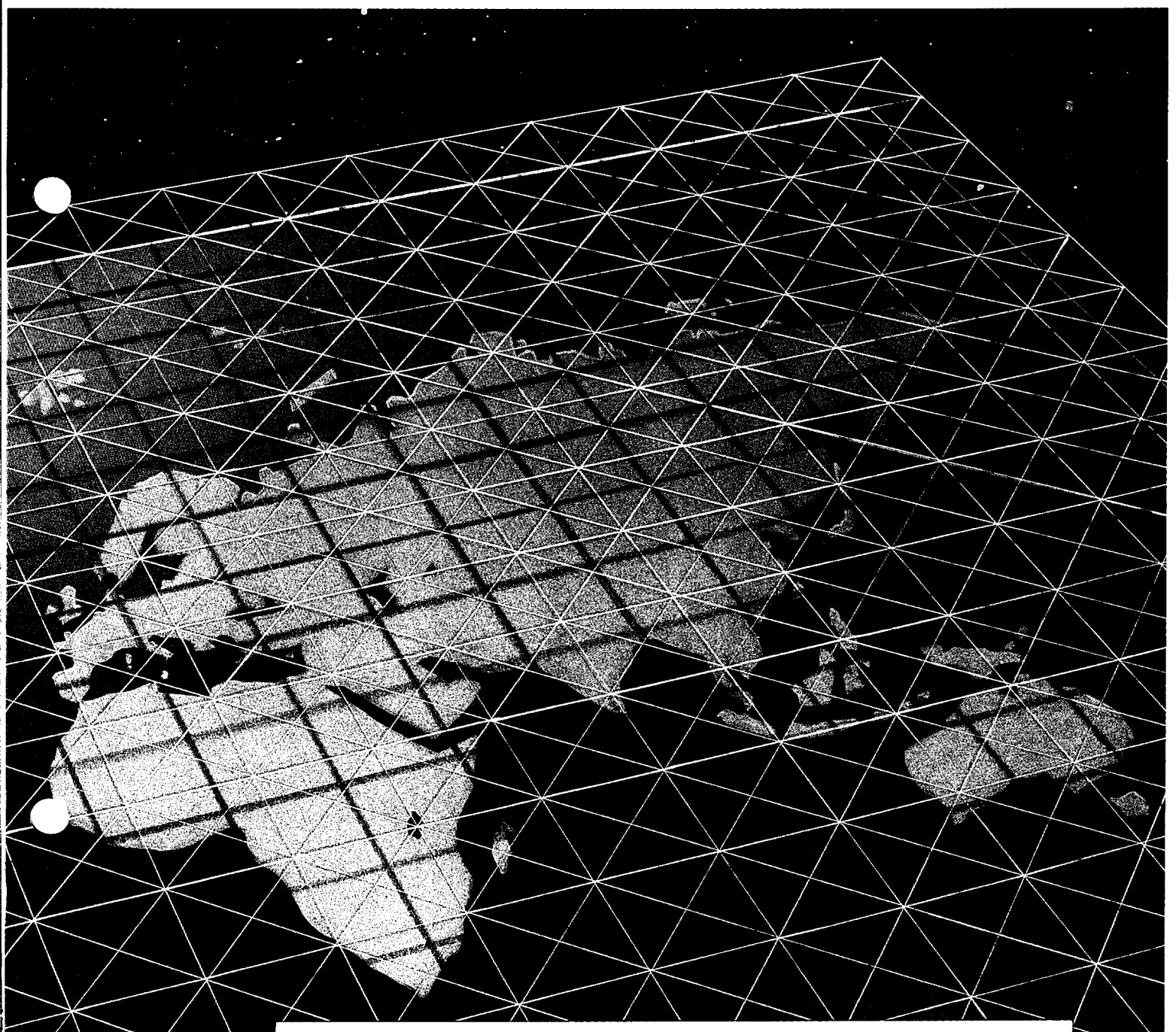
COLLECTE LOCALISATION SATELLITES

Location and data collection satellite system.



CONTENTS





OVERVIEW

The Argos system processes and disseminates space and terrestrial environmental data received from fixed and mobile platforms from anywhere in the world.

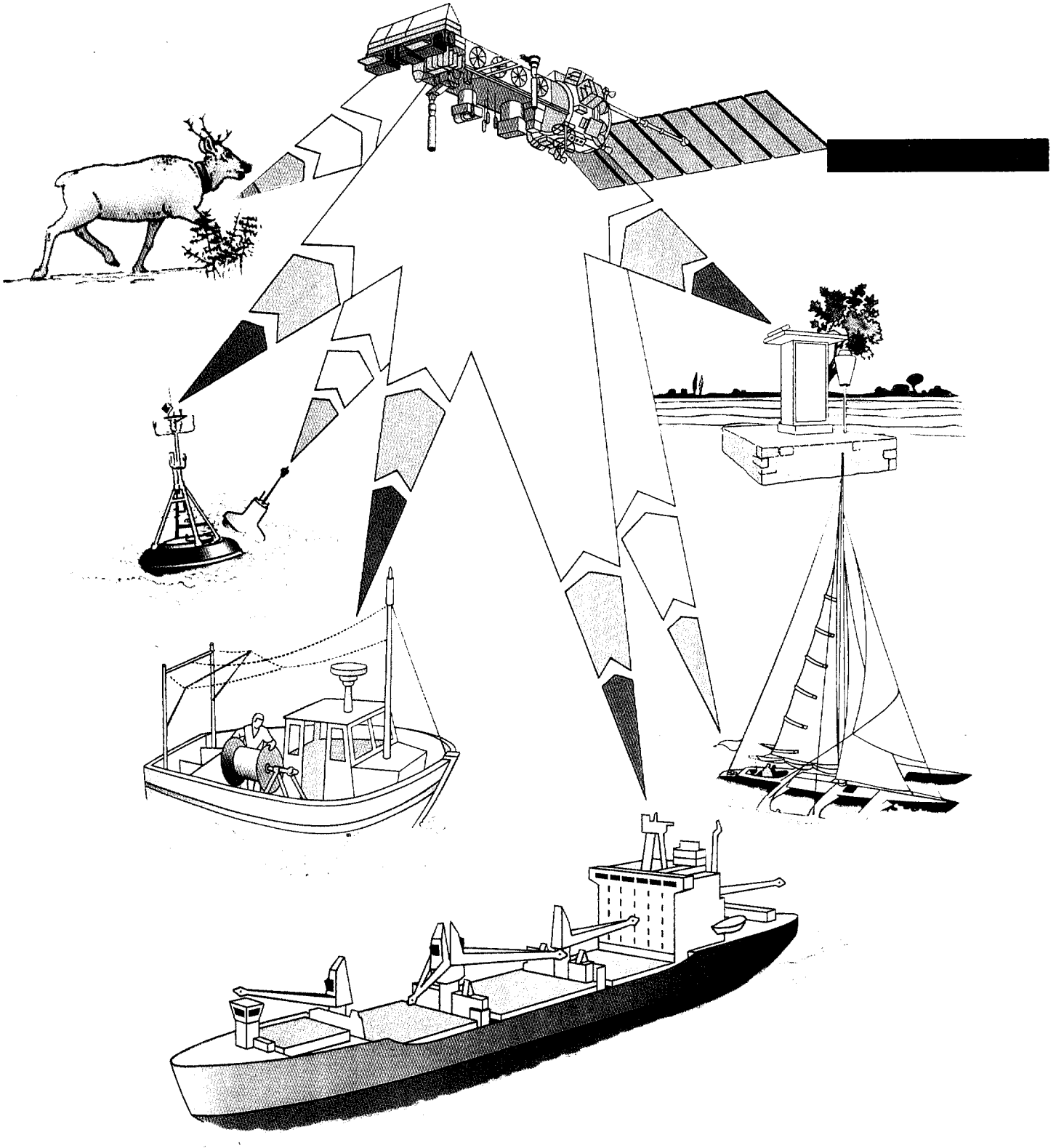
Argos is a joint program of the French Space Agency (CNES, France), the National Aeronautics and Space Administration (NASA, USA) and the National Oceanic and Atmospheric Administration (NOAA, USA). A Memorandum of Understanding signed in 1974 and extended in 1986 defines each partner's responsibilities.

The Argos package is flown aboard TIROS spacecraft NOAA-A through -M, launched at intervals that maintain two simultaneously in orbit. Service has been continuous since 1979 and is expected to continue through 1995 or later.

Argos is essentially reserved for environmental applications. It is a proven and reliable low-cost tool — and so often succeeds where any other system would fail.

System exploitation is the responsibility of CLS, established in early 1986 as a subsidiary of CNES and Ifremer. CLS operates the French Argos Global Processing Center (FRGPC) in Toulouse and handles all user relations outside North America. The American subsidiary of CLS, Service Argos Inc., handles Argos data processing in Washington for all United States and Canadian users.

PLATFORMS

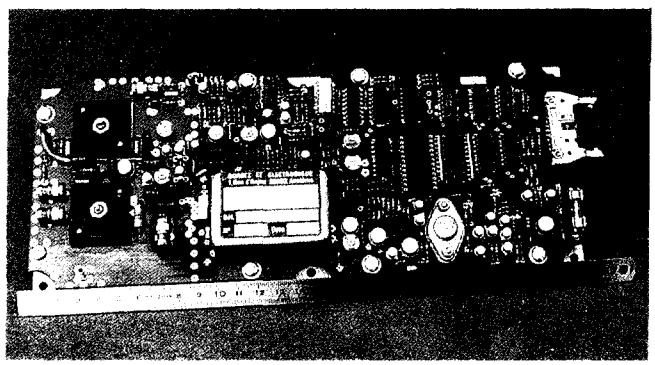


SYSTEM DESCRIPTION

The *system* comprises:
- a set of user platforms, fixed or mobile, deployed at sea, on land or in the air and transmitting independently.
- two NOAA spacecraft in simultaneous orbit, with instrument packages that receive PTT messages on a random access basis, then separate, time-code, format and retransmit the data to ground stations;
- the ground stations and two Global Processing Centers (GPCs) in Toulouse (France) and Landover, Maryland, USA, where data are retrieved, processed, and distributed to users. Each center can take on the full operational workload if the other goes down.

USER PLATFORMS

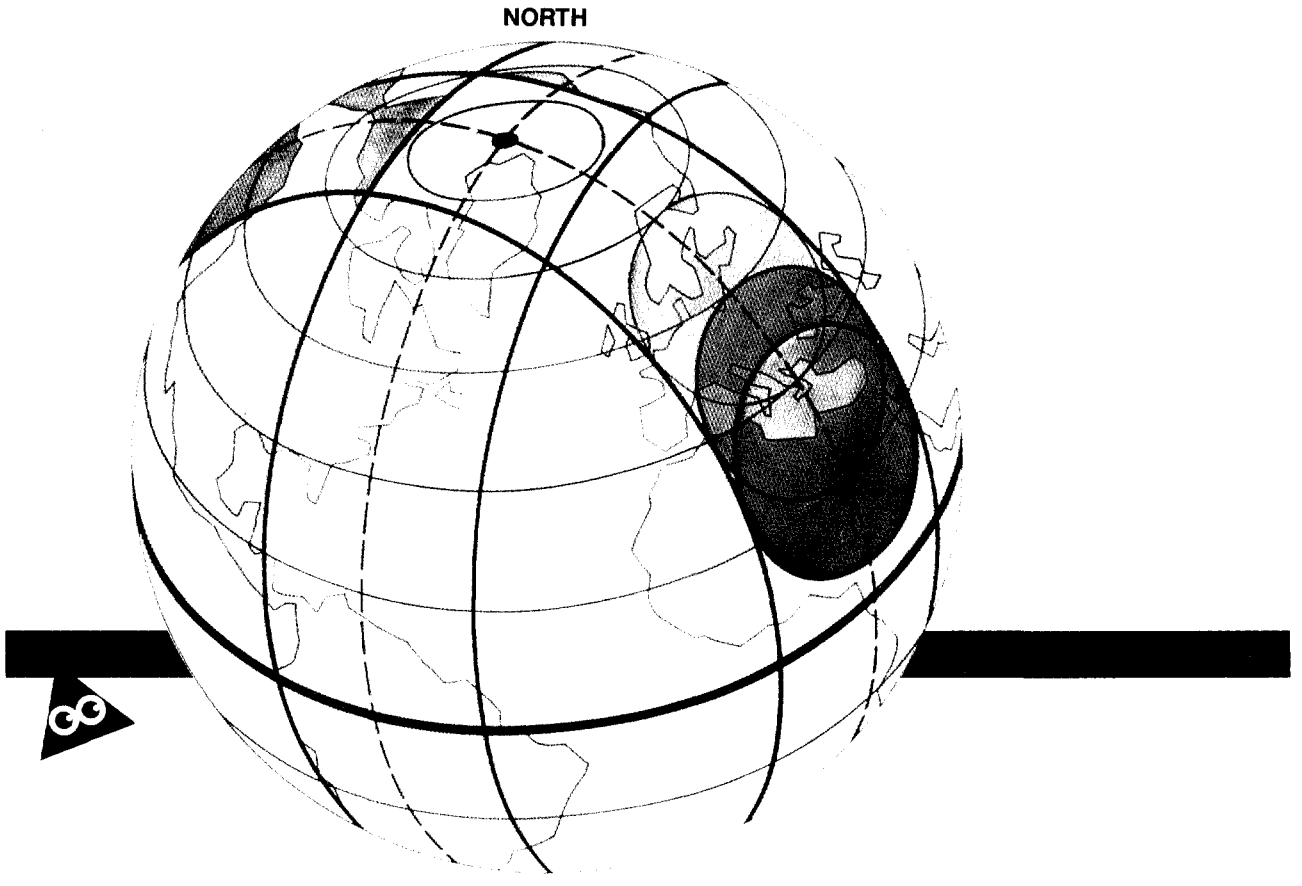
Each platform carries an Argos PTT that assures the satellite uplink. The PTT is powered by rechargeable or disposable batteries, or solar panels or other external sources, and equipped with an antenna. Size and weight are reduced to a minimum. The PTT connects directly to the sensors, and transmits up to 32 measurements, encoded in words of up to 32 bits; the maximum message length is 256 bits.

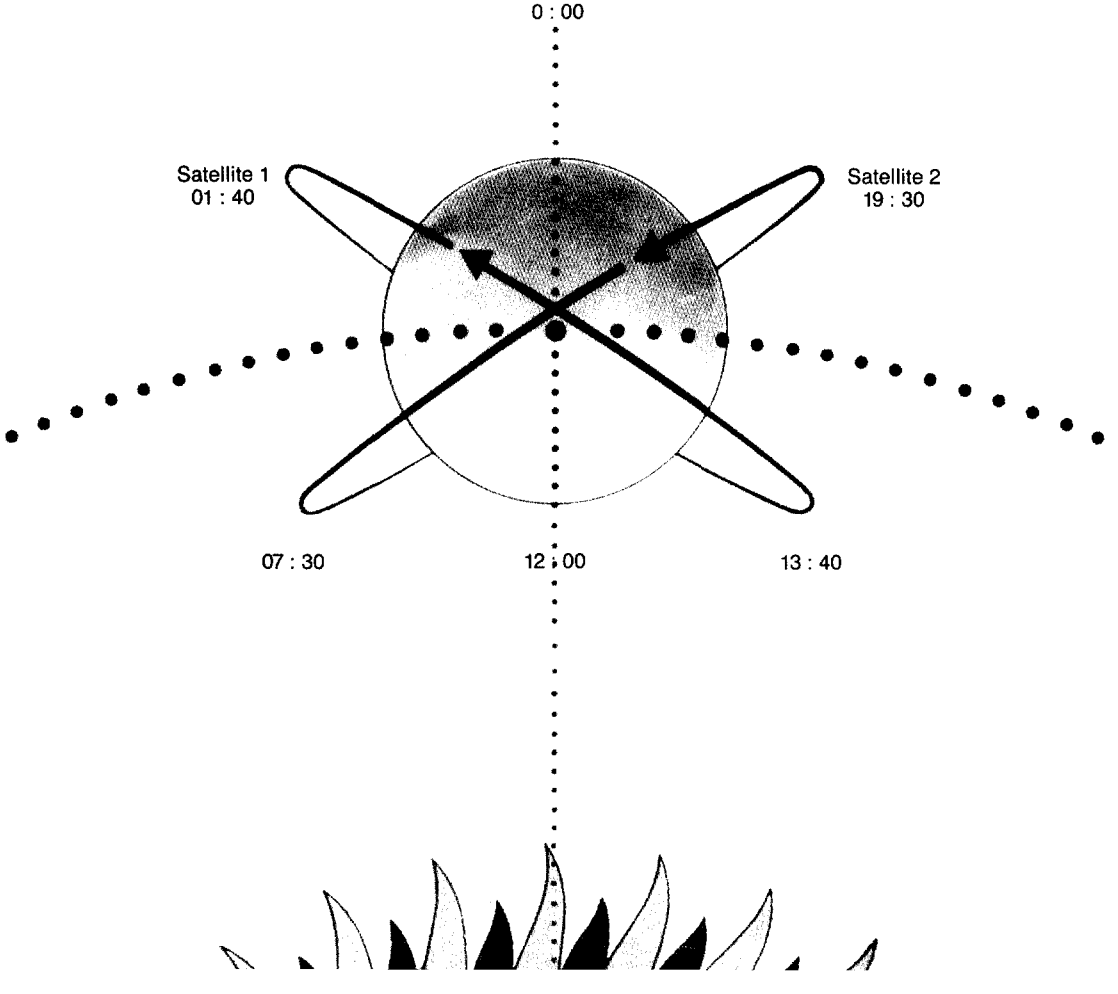


Argos PTTs are simple to operate, light (under 1 kg), inexpensive, and low on power (200 mW on average). The result: Argos is easily implemented and suitable for a very broad range of conditions.
All PTTs transmit on the same frequency (401.650 MHz) at intervals of 40-60 s for location PTTs and 100-200 s for data-collection-only types. Each transmitted message contains the PTT ID n° and the measured values currently in memory. Message length, a function of the number of transmitted measurements, is always under one second (360 - 920 ms).

Certified PTTs

The list of certified PTT manufacturers is published regularly in the Argos Newsletter and also available direct from CLS or Service Argos Inc.


NORTH


0 : 00
Satellite 1
01 : 40
Satellite 2
19 : 30
07 : 30
12 : 00
13 : 40

DATA COLLECTION

Random Access

Each Argos PTT transmits independently at regular intervals, without satellite interrogation. This is the only communication link between the PTT and the spacecraft.

Messages from PTTs within spacecraft visibility arrive randomly at the onboard receiver. Message separation over time is achieved by the non-synchronization of transmissions and by the different repetition periods. Frequency separation results from the Doppler shift in the carrier frequencies, i.e. frequency spreading across the satellite receive bandwidth (24 kHz through NOAA-J, 80 kHz for K, L and M).

If several messages are received simultaneously, the onboard equipment has the capability to process four at a time, providing they are separated in frequency; spacecraft NOAA-K through -M will be able to handle eight messages simultaneously. The probability of collecting from a PTT during a given spacecraft pass is 0.99, providing the messages are identical during the whole overpass (approx. 10 minutes).

SPACE SEGMENT

Orbital Characteristics

- Circular orbit
- Altitude: 833 km for one spacecraft, 870 for the other
- Polar orbit (inclination 98°): both spacecraft see both poles on every revolution
- Period (time for the spacecraft to complete one revolution): 101 minutes
- Orbital planes mutually offset by 90°
- Sun-synchronous orbit: angles between orbital planes and sun direction are constant through the year
- Each orbital revolution intersects the equatorial plane at fixed local solar times: 1.40 and 13.40 for spacecraft 1, 19.30 and 7.30 for spacecraft 2. This is important for the user: it means that the spacecraft come within visibility of a given PTT at the same local solar times each day, thus spacecraft overpass is predictable.

LATITUDE	CUMULATIVE VISIBILITY TIME OVER 24 H	MIN. NUMBER OF PASSES IN 24 H	MEAN NUMBER OF PASSES IN 24 H	MAX. NUMBER OF PASSES IN 24 H	MEAN PASS DURATION
± 0 degree	80 min	6	7	8	
± 15 degrees	88 min	8	8	9	
± 30 degrees	100 min	8	9	12	
± 45 degrees	128 min	10	11	12	10 min
± 55 degrees	170 min	16	16	18	
± 65 degrees	246 min	21	22	23	
± 75 degrees	322 min	28	28	28	
± 90 degrees	384 min	28	28	28	

Orbital Geometry

At any given instant, each spacecraft sees all PTTs within a 5,000-km-diameter circle. On each orbital revolution, the visibility circle sweeps a 5,000-km-wide swath around the Earth, encompassing the poles. Due to the Earth's rotation, the swath shifts 25° westward (2,800 km at the Equator). Data collection capability is related to orbital geometry and is therefore a function of latitude.

The table below outlines the spacecraft pass characteristics over a 24-hour period as a function of latitude:

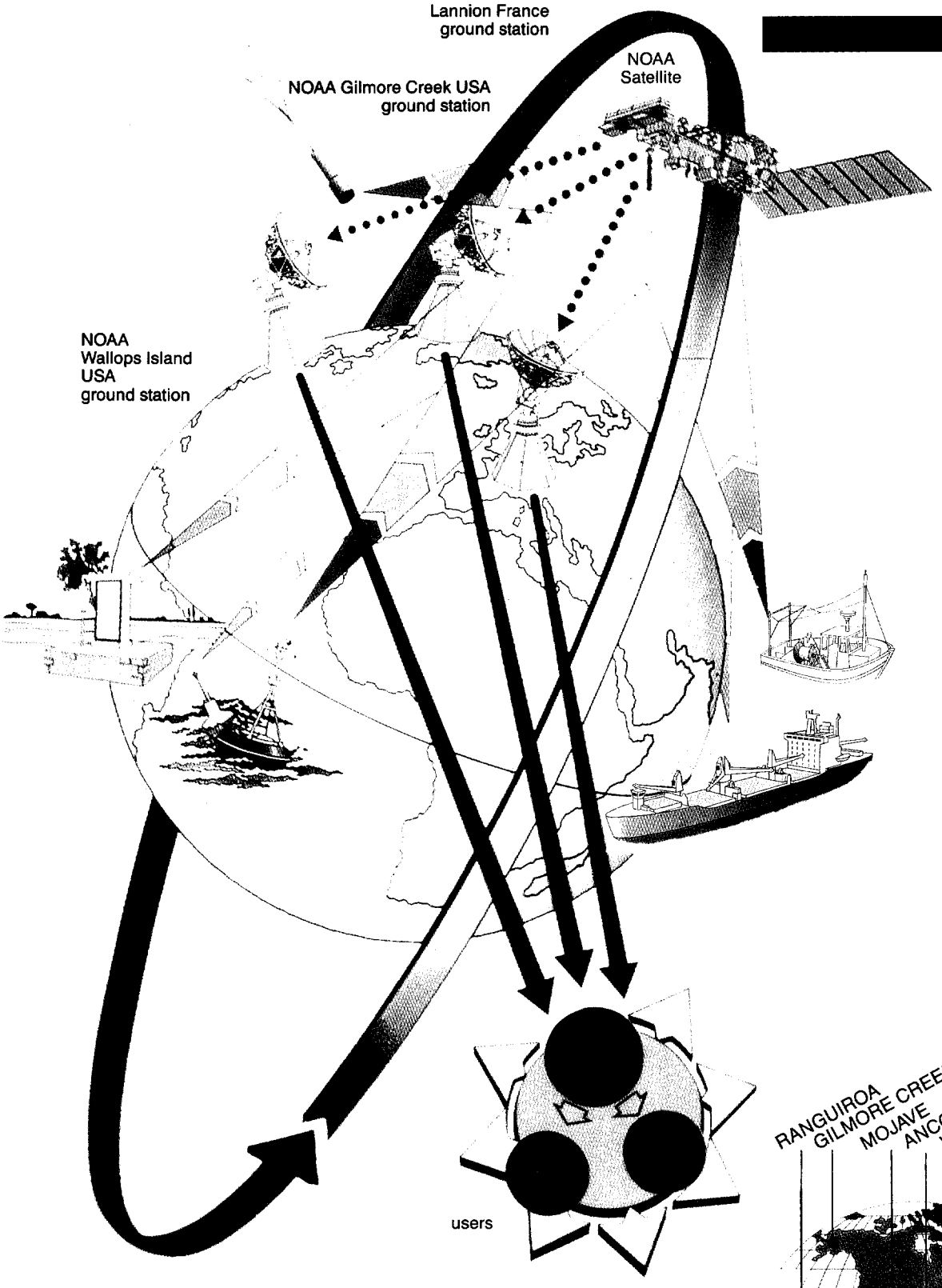
Onboard Package

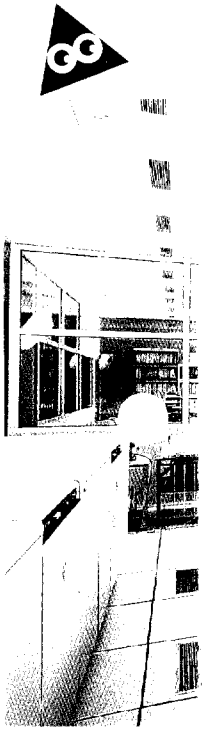
The Argos onboard package receives all messages transmitted by PTTs within the visibility circle on a random access basis. It time-codes each received message, measures the carrier frequency and demodulates the PTT ID n° and sensor data. Four messages can be received and processed simultaneously by spacecraft NOAA-A through -J, and eight for NOAA-K and follow-ons. The data are formatted and stored on one of the onboard tape recorders, and dumped each time the spacecraft overflies one of the three ground stations.

The spacecraft also carry VHF and S-band transmitters for realtime data retransmission. This means that a user station within satellite visibility can receive sensor data from PTTs seen by the satellite at the instant

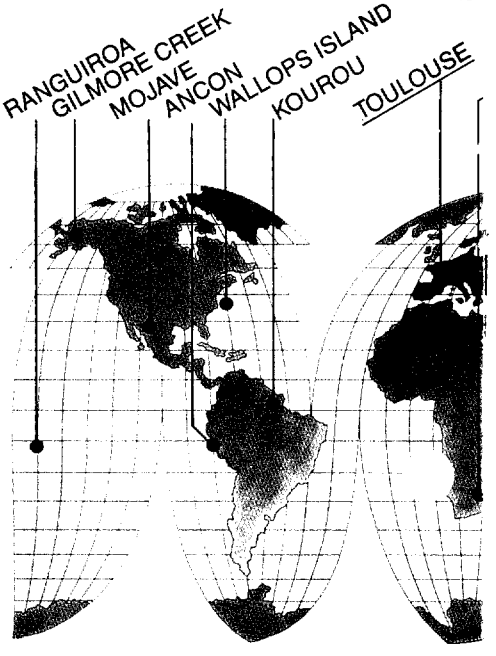
Onboard Package Capacity

Current onboard packages can process up to 1,400 data-collection-only PTTs or 415 location PTTs within the spacecraft visibility circle; capacity will be quadrupled from NOAA-K on.


Lannion France
ground station
NOAA
Satellite
NOAA Gilmore Creek USA
ground station
NOAA
Wallops Island
USA
ground station
users



The


RANGUIROA
GILMORE CREEK
MOJAVE
ANCON
WALLOPS ISLAND
KOUROU
TOULOUSE